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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,658	11/20/2001	Akira Oosawa	Q66559	8995
7590	11/17/2004			
SUGHRUE, MION, PLLC 2100 Pennsylvania Avenue, N.W. Washington, DC 20037-3213				
			EXAMINER LAVIN, CHRISTOPHER L	
			ART UNIT 2621	PAPER NUMBER

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,658

Applicant(s)

OOSAWA, AKIRA

Examiner

Christopher L Lavin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/20/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 5/2, 5/4, 6/2, 6/4, 8, 9, 11, 12/9, 12/11, 13/9 and 13/11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kano (5,359,513).
4. In regards to claim 8, Kano discloses an interimage processing means in the paragraph starting at column 2, line 20. In the paragraph Kano discloses that a “pair of temporally sequential chest images” are used to obtain a different image. In the two paragraph starting at column 9, line 35 and column 10, line 1 Kano discloses an image processing means. In the first paragraph Kano discloses, “in some areas there will be poor matching because of low density regions in one or both images, additional artifacts”. These artifacts and noise are suppressed in the second paragraph through curve fitting. Kano then teaches in the paragraph starting at column 14, line 3 that the image is enhanced thus enhancing the difference relative to the artifacts. In the same paragraph Kano discloses that a CAD system can be used for the detection of abnormal

shadows ("Also, existing computer-aided diagnosis schemes for the detection of abnormalities in the chest images").

5. In regards to claim 9, as shown above in the rejection of claim 8 Kano teaches that the artifact is suppressed more than the difference.

6. In regards to claim 11, as shown above in the rejection of claim 8 Kano teaches that the difference is enhanced more than the artifact (which is suppressed).

7. In regards to claims 12/9 and 12/11, Kano discloses in the paragraph starting at column 5, line 1 that the interimage process includes correlating the images before subtraction. "A curve fitting technique is applied to the mapped shift values, and a nonlinear warping of one of the two images is performed based on the results of the curve fitting analysis."

8. In regards to claims 13/9 and 13/11, Kano discloses in the paragraph starting at column 5, line 1 that an "interval change enhancement between a pair of temporally sequential chest images, including the steps of digitization of a pair of chest radiograph images..." is performed.

9. In regards to claim 1, claim 1 is the method claim of apparatus claim 8. Please see the rejection of claim 8.

10. In regards to claim 2, claim 2 is the method claim of apparatus claim 9. Please see the rejection of claim 9.

11. In regards to claim 4, claim 4 is the method claim of apparatus claim 11. Please see the rejection of claim 11.

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12. In regards to claims 5/2 and 5/4, claims 5/2 and 5/4 are the method claims of apparatus claims 12/9 and 12/11. Please see the rejection of claims 12/9 and 12/11.

13. In regards to claims 6/2 and 6/4, claims 6/2 and 6/4 are the method claims of apparatus claims 13/9 and 13/11. Please see the rejection of claims 13/9 and 13/11.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. Claims 3, 5/3, 6/3, 7/3, 10, 12/10, 13/10, and 14/10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano in view of Yamada (5,937,111).

17. In regards to claim 10, Kano discloses an apparatus for detecting suspected anomalous shadows, which suppresses artifacts while enhancing differences. Kano however does not teach that a morphology operation should be performed to suppress artifacts.

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18. Yamada teaches in the paragraph starting at column 14, line 13 that a morphological operation is performed to suppress artifacts. "The closing processing is carried out in accordance with the second term in Formula 10 by using a multiply structure element B_i , which corresponds to the size of the calcified pattern, or the like, to be emphasized." The calcified pattern is an abnormal shadow, although the shadow of a difference image is larger than the actual calcified pattern. Artifacts or noise are much smaller than an abnormal shadow.

19. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use a morphological operation to suppress artifacts as taught by Yamada in the apparatus disclosed by Kano. Noise and artifacts are often random and relatively small while abnormalities are larger areas. By using morphological operations removing artifacts is a relatively easy operation.

20. In regards to claim 12/10, Kano discloses in the paragraph starting at column 5, line 1 that the interimage process includes correlating the images before subtraction. "A curve fitting technique is applied to the mapped shift values, and a nonlinear warping of one of the two images is performed based on the results of the curve fitting analysis."

21. In regards to claim 13/10, Kano discloses in the paragraph starting at column 5, line 1 that an "interval change enhancement between a pair of temporally sequential chest images, including the steps of digitization of a pair of chest radiograph images..." is performed.

22. In regards to claim 3, claim 3 is the method claim of apparatus claim 10. Please see the rejection of claim 10.

23. In regards to claim 5/3, claim 5/3 is the method claim of apparatus claim 12/10. Please see the rejection of claim 12/10.

24. In regards to claim 6/3, claim 6/3 is the method claim of apparatus claim 13/10. Please see the rejection of claim 13/10.

25. Claims 7/2, 7/4, 14/9, 14/11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano in view of Doi (5,289,374).

26. In regards to claims 14/9 and 14/11, Kano discloses an apparatus for detecting suspected anomalous shadows and in the paragraph starting at column 14, line 3 that a CAD system (Doi) could be used to detect anomalous shadows. Kano however does not disclose that the shadows should be substantially round-shaped.

27. Doi teaches in the paragraph starting at column 8, line 47 that "true nodules generally contained high circularity". Nodules are abnormal shadows. Doi uses the fact that shadows are normally highly circular to detect abnormalities.

28. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use the knowledge taught by Doi that abnormalities are highly circular to detect the abnormal shadows in the apparatus disclosed by Kano. As taught by Doi circularity is a very accurate way of detecting abnormal shadows, using that knowledge makes detecting abnormal shadows much easier.

29. In regards to claims 7/2 and 7/4, claims 7/2 and 7/4 are the method claims of apparatus claims 14/9 and 14/11. Please see the rejection of claims 14/9 and 14/11.

30. Claims 14/10 and 7/3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano in view of Yamada as applied to claim 10 above, and further in view of Doi.

31. In regards to claim 14/10, Kano discloses an apparatus for detecting suspected anomalous shadows and in the paragraph starting at column 14, line 3 that a CAD system (Doi) could be used to detect anomalous shadows. Kano however does not disclose that the shadows should be substantially round-shaped.

32. Doi teaches in the paragraph starting at column 8, line 47 that "true nodules generally contained high circularity". Nodules are abnormal shadows. Doi uses the fact that shadows are normally highly circular to detect abnormalities.

33. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use the knowledge taught by Doi that abnormalities are highly circular to detect the abnormal shadows in the apparatus disclosed by Kano. As taught by Doi circularity is a very accurate way of detecting abnormal shadows, using that knowledge makes detecting abnormal shadows much easier.

34. In regards to claim 7/3, claim 7/3 is the method claim of apparatus claim 14/10. Please see the rejection of claim 14/10.

Conclusion

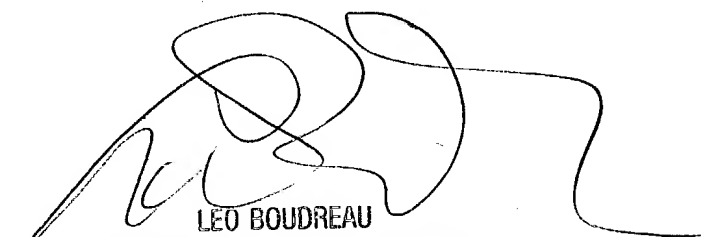
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L Lavin whose telephone number is 703-306-4220. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLL



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